OPERATING MANUAL

AUTOMATIC PNEUMATIC MACHINE TO SET EYELETS (GROMMETS) AND WASHERS

ImagePerfect MODEL: **EP-300**

WARNING:

SPANDEX DECLINES ANY LIABILITY ABOUT THE INCORRECT USE OR MISUNDERSTUNDING ABOUT THIS OPERATING MANUAL.

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1 INTRODUCTION.

1.1 INTRODUCTION.

This machine has been designed to set eyelets and washers, making in just one operation the feeding of the eyelet and washer, cutting and setting. This unit has been specially manufactured to set Image Perfect plastic eyelets.

EP-300 has been designed to set eyelets on PVC banner materials, on fabrics might create wrinkles as it is not possible to make adjustments in the tooling.

The standard eyelets holes are **Ø8, Ø12 and Ø16 mm**.

WARNINGS:

- Lack of knowledge about the machine usually will lead operator to elemental doubts about its operation.
- Please read carefully this operating manual to safety operate the machine and to optimize machine's capability.

1.2 MACHINE IDENTIFICATION AND "CE" MARKING.

Each machine has a data plate on the side, made on aluminum. The following specifications are on it:

- Manufacturer's name and data.
- Year of production.
- Model and serial number.
- Maximum air pressure (in bars).
- "CE" mark.
- Weight.

2 TECHNICAL DATA.

2.1 MACHINE SPECIFICATIONS AND OPERATION.

EP-300 is mounted on a plastic (PE) table with four wheels on the corners and one in the center, all of them with breaking system. It has been designed to set fully automatic eyelets and washers, only eyelets or just to punch holes on the material.

The machine has a main head where all the parts are located (fixed and moving ones), such us pneumatic cylinder, setting dies, safety, deposits, eyelets and washers raceways, electronic controls ...

Inside the red cover are the electronic controls (PLC, power source, fuse ...), the pneumatic cylinder and the feeding mechanism. On right hand side are the electro valves, emergency stop, on/off switch and setting button.

EP-300 is delivered on wheels to work on ground level or over a table. If customer needs to work on a fixed position, the breaks of the four wheels should be on for safety reasons.

Once the machine has been place on its permanent location, without fitting the air hosepipe into the connection, verify that it has not suffered any blow or breakage while being transported and it has not any loose parts.

EP-300 do not have adjustments in terms of setting pressure or cutting pressure.

The operation of the machine is very simple (see Fig. 1):

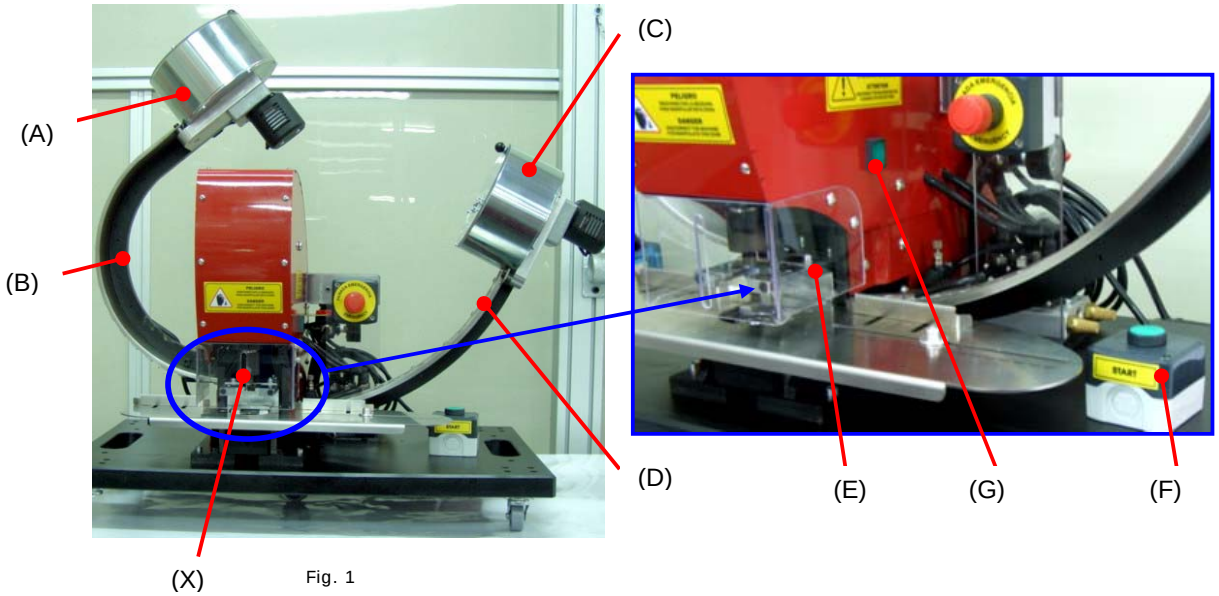


Fig. 1

As seen on Fig. 1, eyelets are on the deposit (A) and washers on the deposit (C). Both deposits have 220 V motor. When turning, eyelets and washers come down through the raceways (B) and (D) towards the feeding area (G) where setting dies are located to make cutting and closing of the eyelet.

1. EP-300 is controlled by a PLC located inside the red cover of the machine. When pressing the setting button (F), the feeding system located on the back of the machine will be pushed to the front by a small pneumatic cylinder, feeding one eyelet and one washer from the raceways to the feeding area (E).

2. The main pneumatic cylinder inside the red cover will make its vertical axle to descend. Attached to its lower part there is the top setting die with a puncher. The aim of the downward movement of the axle is to cut a hole with the puncher and as an effect of the pressure that the top die does on the bottom one, to set the eyelet (grommet) on the setting area "X".

3. Once the cutting is made, the shaft will continue pressing down, making the eyelet to roll and close, holding the washer.

4. All parts will return to its starting position leaving the machine ready for another cycle.

2.2 MAIN TECHNICAL DATA.

The main technical data of this machine are:

Width x Depth x Height	24 cm x 32 cm x 41 mm.
Weight	48 Kg
Air pressure	6 bars / 87 psi.

3 INSTALLATION.

3.1 INSTALLATION POSITION REQUIREMENTS.

The minimum space recommended must be sufficient to keep that safety space in all directions for the operator to work properly.

WARNINGS:

Please note that that both the electrical wire and the air hosepipe should never be completely stretched.

3.2 PNEUMATIC INSTALLATION.

The machine has an air inlet valve, type quick acting coupler (ISO 6150-B standard) ∅8 mm, located in the back of the machine (H).

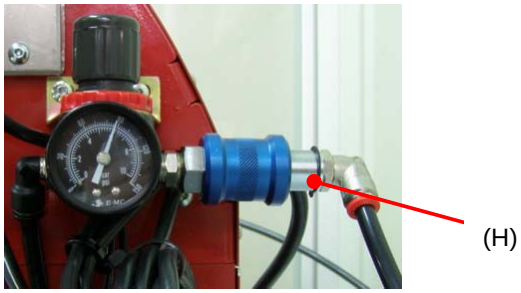


Fig. 2

For an optimal operation, the supply of compressed air should be **6 Kg/cm^2**. It is important, especially when working with Ø16mm eyelets that the pressure doesn't drop after one of two settings as the machine might not have enough power to close the eyelet. If this happens you will require a bigger compressor with more power.

We recommend that the flexible air hosepipe from the compressor or pneumatic installation comes from the top of the building to avoid operator's injuries or damages on the equipment.

3.3 TRANSPORT.

Always unload the crate with a forklift, securing the load with slings on the sides.

To transport the machine to its permanent location, the following precautions should be taken in account:

- Never stand beneath the wood crate.
- Use protective gloves.
- Avoid balancing the machine.
- Never overturned the machine.
- Lift or move the load gently.
- Do not make sudden movements.
- Always move the machine in vertical position.

The machine is delivered with appropriate packaging to avoid shocks and frictions during transport.

In the event that for some reason it is necessary to transport again the machine after its installation and the customer does not have the original packaging, we advice to use a reinforced package made of wood.

3.4 UNLOADING AND LEVELLING.

EP-300 is delivered fixed to the wood crate with screws on both sides of the plastic (PE) platform.

Please follow these steps:

- Open the wooden crate.
- Remove the protective film.
- Loosen the screws on both sides of the plastic (PE) platform that tight the machine to the base of the crate.
- Move the machine to its location with a hand pallet truck.

If the machine will work on a bench, it must be strong enough and leveled. Before any operation with the equipment, the four breaks on the wheels must be on.

3.5 LIGHTING CONDITIONS.

A safe operation and servicing of the machine requires a **minimum lighting of 300 lux**.

3.6 LEARNING INSTRUCTIONS.

Please read carefully these instructions before starting:

- Before connecting the machine to the power supply, compressor or to customer's pneumatic installation, it should be place on its permanent location.

- The cleaning, handling or replacement of parts should always be made with the air inlet valve shut and the power off.

- Do not remove from the machine the safety devices, stickers or warning sings that point out dangerous areas. In case of withdrawal by force majeure, please remember to place them back before using the machine again.

- The machine has an air inlet valve “H” (fig. 2) to manually open and close the air supply to the machine; When the machine is not in use, it should be shut (see fig. 3) to avoid accidents when use by a third party. We also suggest disconnecting the hosepipe from the compressor/air supply for safety reasons.

- The machine has an ON/OFF switch (G), (see Fig. 1). When the machine is not in use, it should be on OFF position, (no lighting on the switch) to avoid accidents when use by a third party. We also suggest unplugging the electrical cord from the socket for safety reasons.

The dangerous area of the machine is the cutting and setting area that is protected by an acrylic shield and the stainless steel plate. Never access this area with the main switch on ON position and the air inlet valve open.

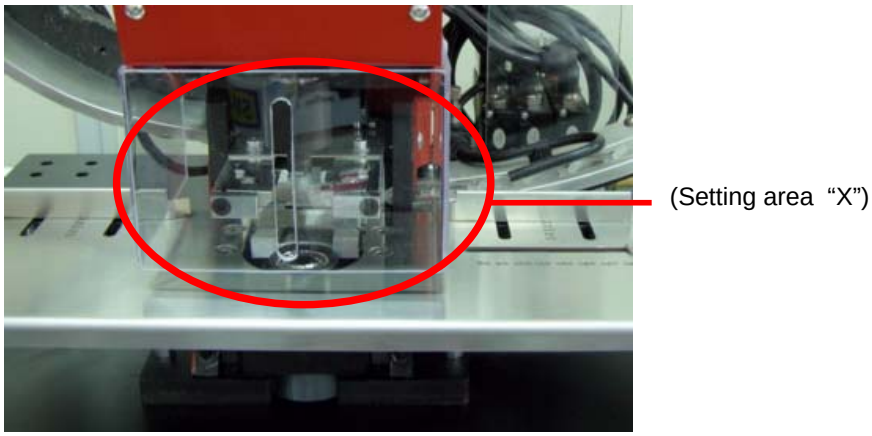


Fig. 3

Operator should pay attention to the position of the air inlet valve (H) (See Fig 2) located on the back of the machine. When the valve changes its position from open to close, the compressed air on the internal circuit of the machine is expelled, preventing any unexpected action from the pneumatic cylinder if by accident the pedal is pressed.

CLOSE position

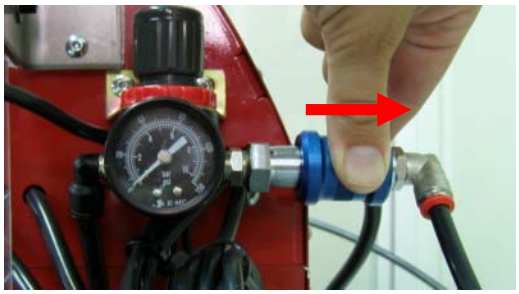


Fig. 4

OPEN position

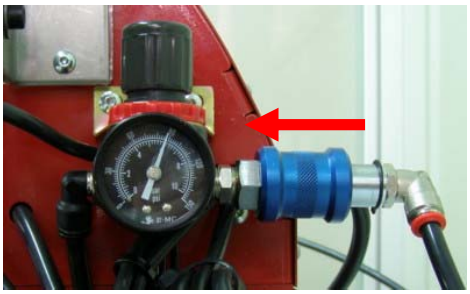


Fig. 5

4 MACHINE OPERATION.

4.1 MACHINE DESCRIPTION.

This machine has been designed to set eyelets with washers, feeding the machine automatically both parts, on PVC coated material and in general terms on plasticized materials, but not on fabrics as it might create wrinkles due to its setting system. The maximum cutting diameter is **16 mm** (the machine is supplied, adjusted and ready to use with the eyelet size required by customer on its order, standard is 12 mm).

The machine feeds the eyelet, the washer, cuts the material and sets in just one operation.

Each set of dies has been designed to work with only one eyelet size with its washers, the models may differ on:

⇒ EYELET (I):
- o Head diameter "D".
- o Eyelet height "L".
- o Internal hole diameter "d".

⇒ WASHER (J):
- o Outside diameter "F".
- o Washer height "H".
- o Internal hole diameter "i".

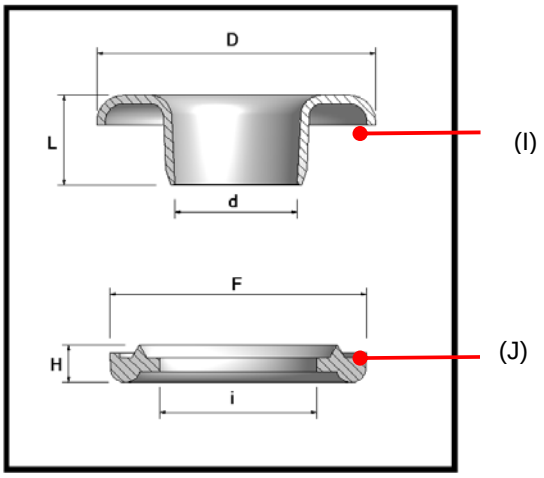


Fig. 6

If you need to set different eyelet sizes, you will require different machines as it not possible to change models.

Spandex disclaims any responsibility when using the machine for different uses than the ones covered on this operating manual.

4.2 CHECKING THE MACHINE BEFORE STARTING.

Before using the machine for the first time, or when the location of the machine is changed, or adjustments or part replacements are made, we advice customers to check that the machine has not suffered a blow or breakage.

The main controls are on the right hand side of the machine:

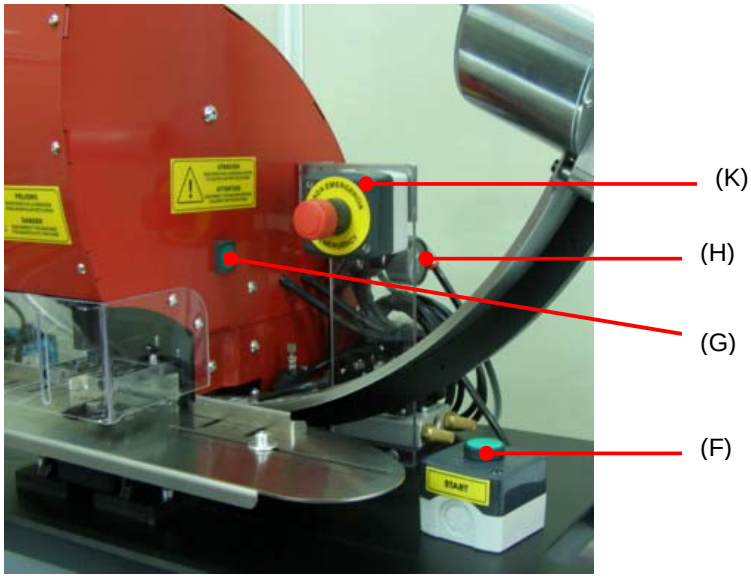


Fig. 7

4.3 EYELET SETTING.

1. Check that the air inlet valve “H” is on OPEN position (fig. 5).
2. Check that the main switch (G) is on ON position (with the green light on).
3. As soon as the machine is on position “ON”, the engines on both deposits will start to turnaround. The brushes push out the eyelets and washers filling the raceways. To extend the life of the engines, they will stop when operator is not using the machine for a period of 25 seconds. First time on is pressed will run for 90 seconds to fill raceways.
4. Place the banner over the stainless steel plate underneath the safety protection (L) (see Fig. 8).
5. Press the setting button (F) so the eyelet and the washer are moved to the front and the main shaft comes down making the cutting of the material and the setting of the eyelet.
6. There is safety timing in between one setting and the next so all moving parts have enough time to return to its original position. After it, the machine will be ready to set another eyelet.

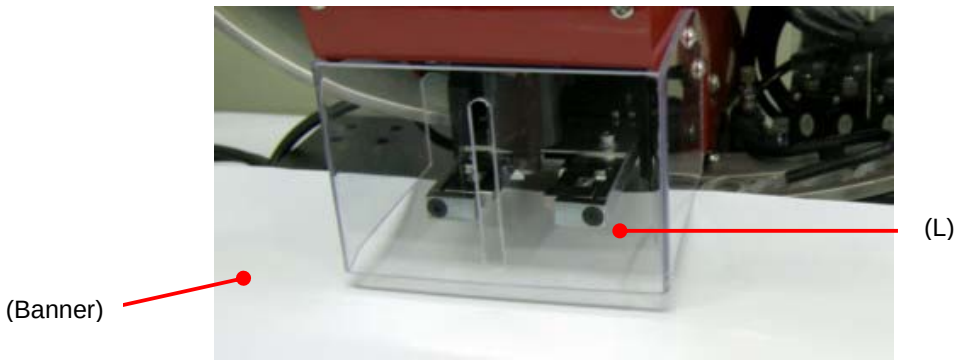


Fig. 8

4.4 OTHER MACHINE APPLICATIONS.

To cut holes on the material, without setting eyelets, it will not be necessary to install specific tooling; it will be possible to make it with the same ones use to set the eyelets. Hole diameter will not be more than 16mm.

5 ADJUSTMENTS.

5.1 WARNINGS ABOUT THE ADJUSTMENTS.

The parts that should be replaced on a regular basis due to normal wear are the cutting or bottom die "M" and setting or top die "N". We will see that the parts need to be replaced when either the cutting or the setting is not accurate. We always recommend having a spare set of these parts on your stock.

Fig. 9

When doing maintenance operations if by any reason it is necessary to remove parts meant for operator safety (safety protection, stainless steel plate ...) remember to put them back where they belong and fasten them firmly.

WARNING: Shut the general air inlet valve to CLOSE position (see Fig. 4) and main switch "G" on OFF (no lighting) to change dies, install optional equipment or any other handling.

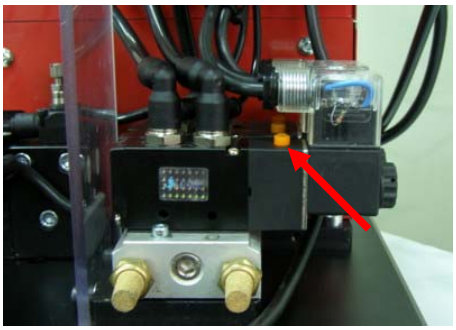
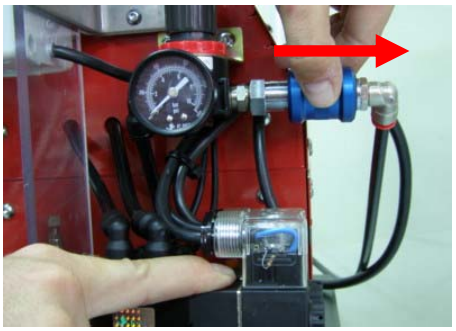
5.2 DIES CHANGING FOR SAME DIMENSION.

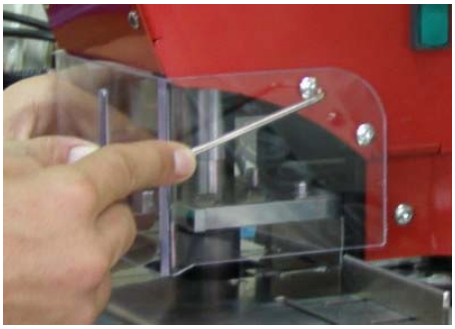
Whenever is necessary to replace the dies for its normal wear you should follow these steps:

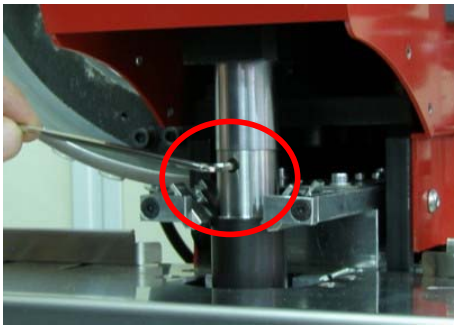
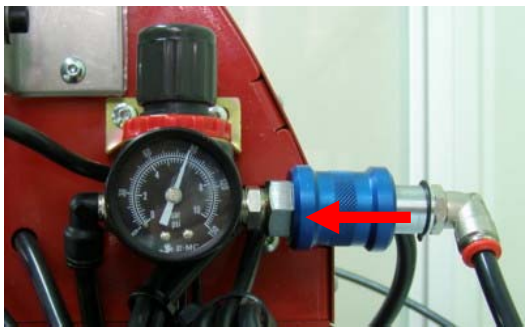
WARNING:

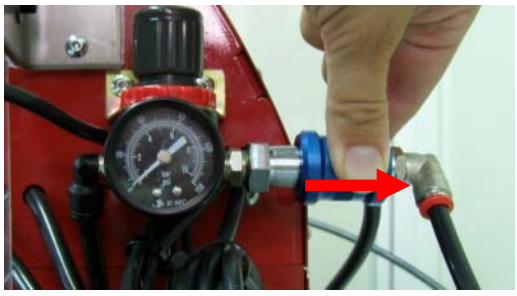
To install a new set of dies it will be necessary at some point to take out the safety protection "L" (see Fig. 8). ALWAYS place it back before using the machine again.

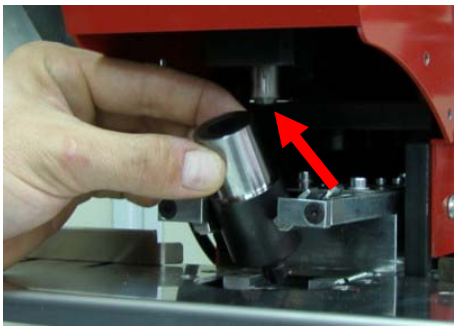
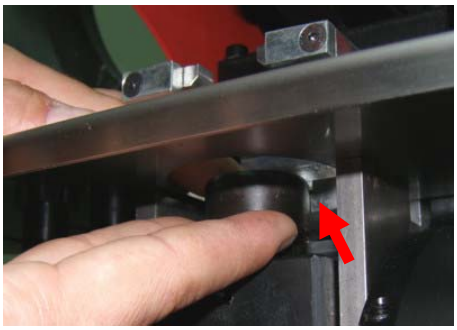
Please be very careful while doing adjustments, always making sure that your hands and fingers are out of the setting area (X) (see Fig.3) and that nobody can press the setting button (F) (see Fig. 7) that will start the setting operation catching hand or fingers.

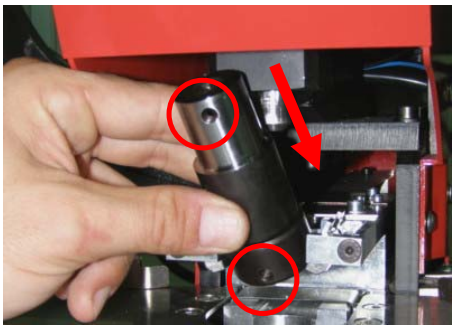
	On the back of the machine are the electro valves (3) that distribute the compressed air to run the different operations needed to set the eyelets. The first one controls the main cylinder (that has the top die) and has an orange switch. On its back has a label “EV2”
	With one finger press the orange switch and do not remove it. The axle of the cylinder will descend.
	Without releasing the finger on the switch, shut off the air inlet valve so the axle of the cylinder stays on its lower position. When the valve changes its position from open to close, the compressed air on the internal circuit of the machine is expelled, preventing any unexpected action from the pneumatic cylinder.

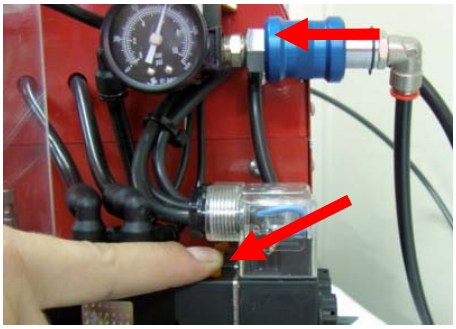
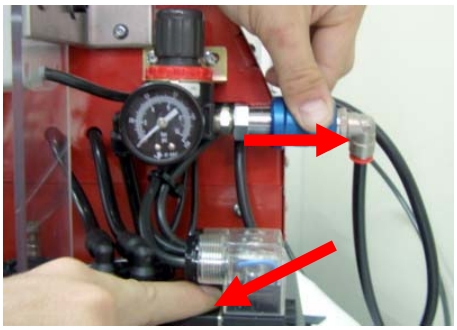
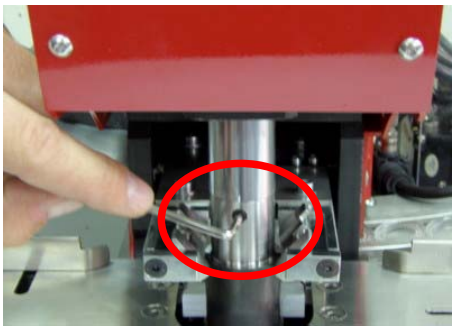
	With an allen wrench, loosen the four screws of the safety cover on the front of the machine.

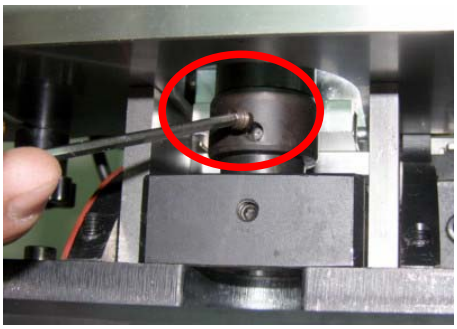
	Remove the set screw from the top die. IT IS IMPORTANT NOT TO DAMAGE THE MACHINE THAT YOU REMOVE THE SCREW FROM THE DIE, NOT JUST LOOSEN IT.
	Remove the set screw from the bottom die. IT IS IMPORTANT NOT TO DAMAGE THE MACHINE THAT YOU REMOVE THE SCREW FROM THE DIE, NOT JUST LOOSEN IT.
	Open the air inlet valve so axle of the cylinder moves towards its upper position.

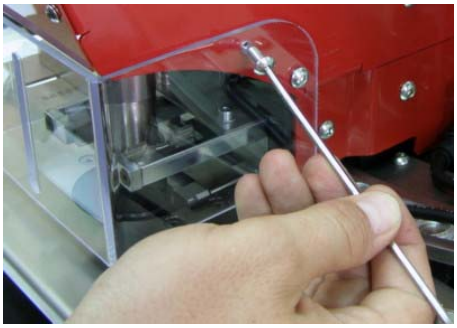
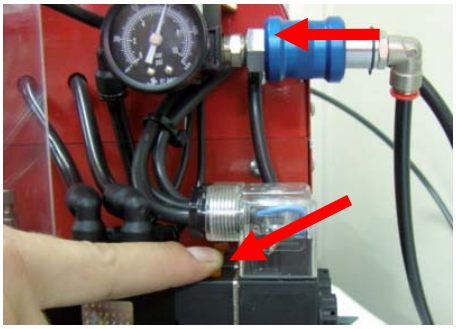
	Close the air inlet valve to access the setting area.

	Remove top die form the axle of the cylinder.
	Remove bottom die. Place your fingers underneath the stainless steel plate and lift it gently.
	1. Remove from the new die the set screws (top & bottom). 2. Assemble new die putting both parts together. 3. Check that the holes of the set screws are on the same side, as they have to be on the front of the machine.

	Install the new die with the holes for the set screws looking to the front of the machine.

	With your hands out of the setting area: 1. Open the air inlet valve. 2. Press the switch of the first electro valve so axle of the cylinder descends.
	Without removing your finger from the first electro valve, close the air inlet valve.
	With an allen wrench, install back the set screw of the top die.

	With an allen wrench, install back the set screw of the bottom die.

	Tighten the four screws of the safety protection.
	Open the air inlet valve and with your finger press the first switch of the electro valve to check that the top die fits well into the bottom one. Once we have finished these operations we will be ready to start making settings as usual.

6 MAINTENANCE.

There is no need to lubricate any mechanical parts of the machine.

For an optimum operation of the EP-300 it is important to have some parts clean, and this operation should always be done with a) the main air inlet valve on position “OFF” and b) the main switch on “OFF” position (no light on).

The raceways where eyelets and washers come down should be always kept clean; we recommended doing it at the end of the day with compressed air. Any threads or small parts on the raceways may stop the eyelets and washers from coming down.

It is important to clean setting area, especially the top die where threads will remain on the puncher as marked on Fig. 9.

Fig. 9

Fig. 10

We recommend doing it with an air gun through the open space on the safety cover in the front of the machine. This operation should be done at least once per day, but depending upon the type of materials used might be necessary to increase the timing between cleaning.

The push button should always be clean and clear of any parts that could interfere on its normal operation.

The outer parts of the machine should be cleaned with a cloth that will leave no threads (really important on the raceway channels were eyelets/washers come down).

If the machine is going to be a long period with no use please follow these recommendations:

1. Disconnect it from the compressor
2. Disconnect it from the power source.
3. Clean it.
4. Cover it to avoid humidity and dust.

It is important that the machine is connected to a compressor or local air installation with an air filter.

7 FAILURES.

7.1 TROUBLESHOOTING.

PROBLEM	CAUSE	SOLUTION
The machine does not work.	1. Check that the air hosepipe is connected to the compressor.	1. Connect the air hosepipe.
	2. Check that the air inlet valve is on open position.	2. Open the air inlet valve.
	3. Check that main switch of the machine is on position "ON" (with light).	4. Change the position to "ON".
	3. Check that the air pressure on the circuit is 6Kg/cm^2.	3. Adjust the pressure gauge until the manometer has the correct pressure.
The machine does not cut.	1. Check that the air pressure on the circuit is 6Kg/cm^2.	1. Adjust the pressure gauge until the manometer has the correct pressure.
	2. The edge of the bottom die is either worn out or damaged.	2. Change the die.
The eyelet crushes when setting.	1. Check that the pressure of the circuit is no more than 6 Kg/cm^2.	1. Adjust the pressure with the manometer to 6 Kg/cm^2.
Suddenly the eyelet does not close completely.	1. Check that the pressure of the circuit is 6 Kg/cm^2.	1. Adjust the pressure with the manometer to 6 Kg/cm^2.
Washers /Eyelets do not come out of the deposit	1. Check that there are is nothing blocking the exit of eyelets/washers in the deposits.	1. Stop the deposits and clean the hole where eyelets/washers come out.
	2. Check that the deposits (especially on the washer's one) is not overload.	2. Take out part of the load so the brushes can turn freely.
The machine leaks air.	1. Check that the position of the air inlet valve is completely in OPEN position.	1. Move completely the valve to OPEN. When is set halfway the air will be expelled.

8 SAFETY.

8.1 SAFETY DEVICES.

The machine has a range of protection devices to prevent operator (except on maintenance or repairs) from accessing dangerous areas where can be injured.

The dangerous part of the machine is the setting area “X”, where operator has the risk of crushing his fingers or hands.

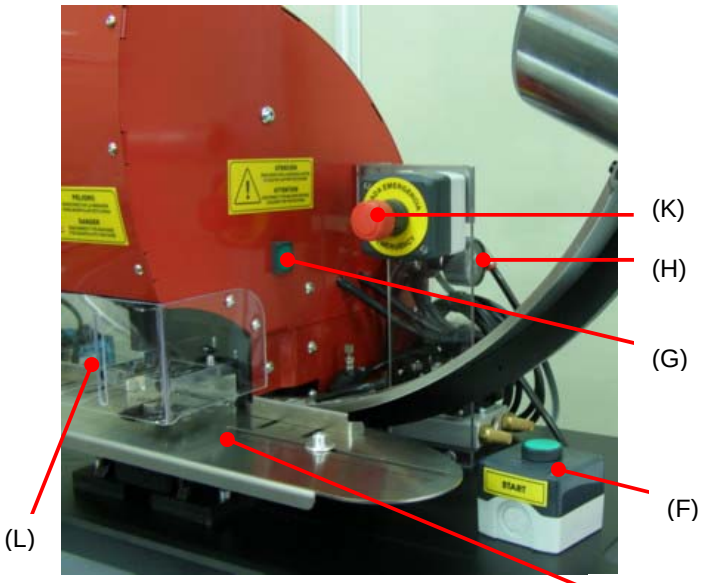


Fig. 11

Fig. 12

The dangerous area “X” is protected by the following devices:

⇒ **Acrylic safety protection (L)**: Prevents the access of operator’s hands or fingers to the setting area.

⇒ **Stainless steel plate (O):** This plate prevents the access of operator’s hands or fingers to the dangerous area.

⇒ **General air inlet valve “H”:** This valve allows manually opening or shutting the pneumatic air supply from the compressor or general air installation. As safety device, it has a decompressing system, when the valve changes its position from open to close; the compressed air on the internal circuit of the machine is expelled, preventing any unexpected action from the pneumatic cylinder when making assembling or adjustments on the machine.

CLOSE position

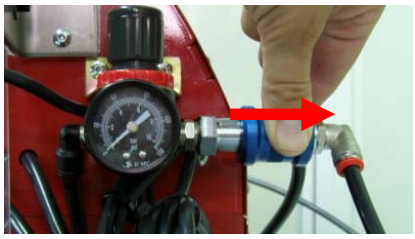


Fig. 13

OPEN position

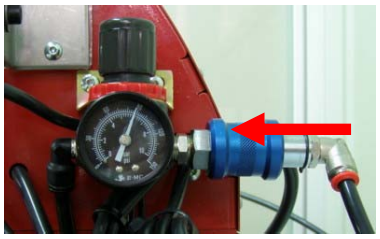


Fig. 14

⇒ **Main switch "G":** When set on "OFF" position (no light) will not set eyelets even if you press the setting button (F).

⇒ **Emergency stop "K":** It will cut all power off when use by operator in case there is an emergency running the equipment.

There are a series of labels on the machine that operator should read:

⇒ **Label "Read manual"**: This label on left hand side of the cover of the machine explains operator that is mandatory to read the operating manual.

Fig. 15

⇒ **Label "Danger":** This label on the front of the cover informs operator that there is danger of crashing hands and fingers when manipulating this area.

Fig. 16

⇒ **Label "Disconnect the machine before taking out protection":** This label on the right of the cover informs operator that before taking out any protection the machine must be disconnect it (shut air inlet valve) and main switch off.

Fig. 17

9 ANNEX.

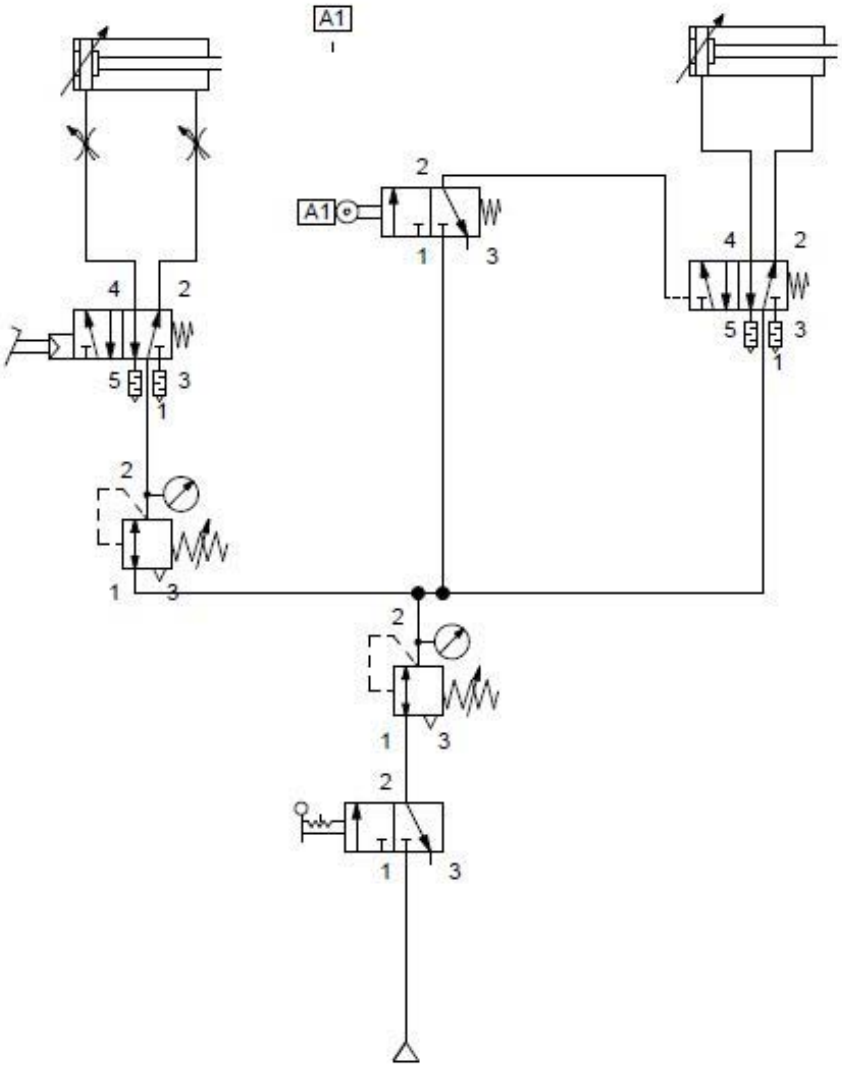
9.1 SPARE PART LISTIG.

REFERENCE	DESCRIPTION
EP-300 Die 12mm	
EP-300 Safety protection	
EP-300 Brushes	
EP-300 Acrylic deposit cover	

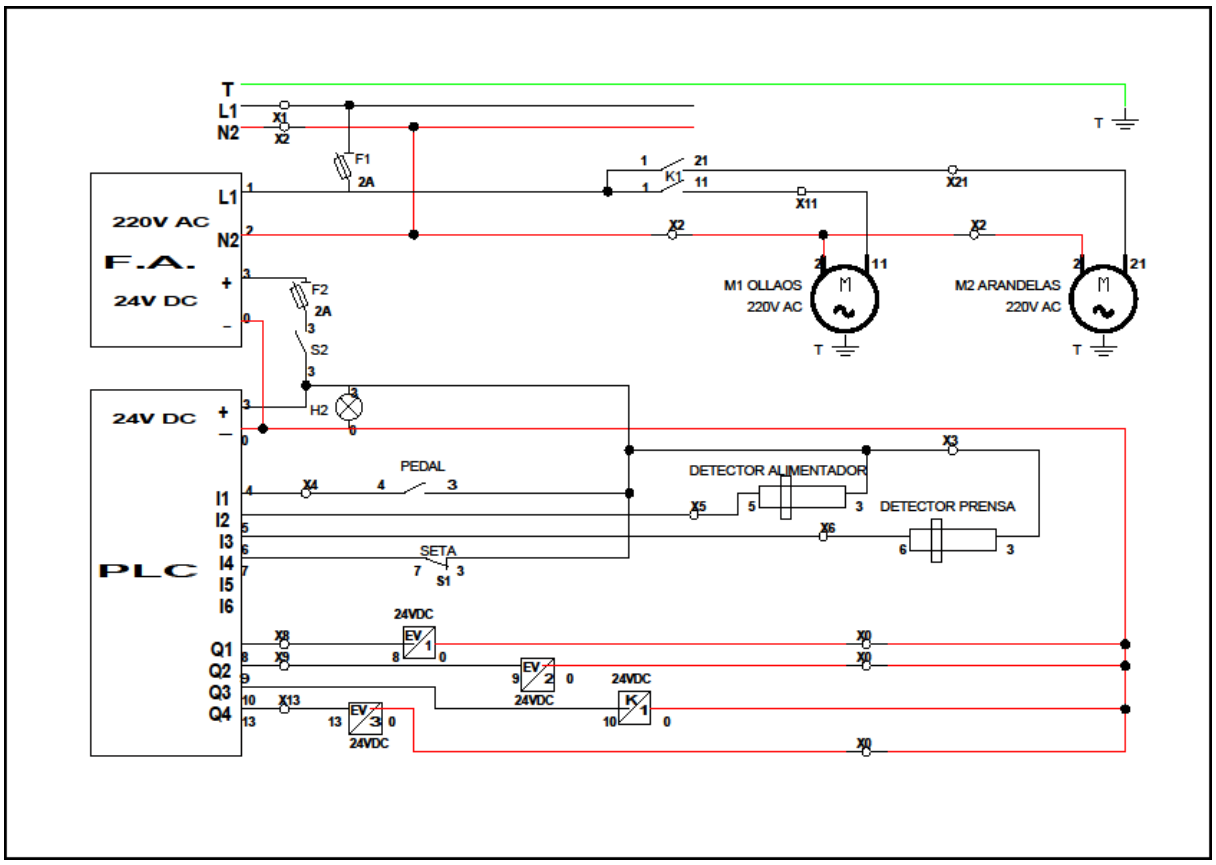
9.2 SUPPLIED TOOLING.

REFERENCE	DESCRIPTION	QUANTITY
ALLEN # 3		1

9.3 PNEUMATIC DRAWING.



9.4 ELECTRICAL DRAWING.



9.5 GUARANTIES.

Model EP-300 has a guarantee period of 12 months since purchasing.

Within this period, Spandex will replace free of charge all spare parts that under Spandex knowledge have manufacture defects

The guarantee will not cover assemble / disassemble of the unit but will cover their freight cost.

The guarantee will not cover those parts with normal wear for the machine use as the setting dies.